

Vita

Candidate's name: Ethan Norman Augustine

Universities
Attended: University of New Brunswick (2020)
Bachelors of Science

University of New Brunswick (2022)
Masters of Science
Biology

Presentations / Publications:

Marine Block Guest Lecture, 2021. "Stable Isotope Analysis, American Eels and *A. crassus*"

Augustine, Ethan N., Hayden, Brian, Sacobie, Charles F.D., Jayawardane, Aruna, Ward, Devin, Scott, Stephanie, Duffy, Michael S. Stable isotope (C&N) analyses of American eel (*Anguilla rostrata*): A new lipid estimation model for eel muscle and use of eel fin as a non-lethal surrogate tissue. Submitted to Journal of Fish Biology. Manuscript number: JFB-MS-22-0424

Evaluation of the influence of American eel (*Anguilla rostrata*) trophic interactions on *Anguillicola crassus* infection and new methods for stable isotope analysis of eels

UNIVERSITY OF NEW BRUNSWICK
THESIS DEFENCE AND EXAMINATION

in Partial Fulfillment

of the Requirement for the Degree of
Master of Science

by

Ethan N. Augustine

in the Department of Biology

U.N.B., Fredericton, N.B.

Friday, October 14th, 2022
10:00 a.m.

Bailey Hall, room 22

Examining Committee

Dr. Charles Sacobie
Dr. Mike Duffy
Dr. Kurt Samways
Dr. Amy Scott
Dr. Jason Addison

Co-Supervisor
Co-Supervisor
Internal Examiner
External Examiner
Chair of Oral Examination

Abstract

The American eel, *Anguilla rostrata*, is a culturally, commercially, and ecologically important species in eastern North American river systems. They are currently facing several threats, one of which is the parasitic nematode *Anguillicola crassus*. My research sought to improve understanding on how *A. crassus* is transmitted in a river system using stable isotope analysis, as well as to improve methods for isotope analysis of both eels and *A. crassus* nematodes. I found that trophic position in conjunction with condition factor is associated with higher *A. crassus* infection intensity in yellow eels. Additionally, I discovered that $\delta^{15}\text{N}$ of *A. crassus* nematodes is significantly affected by the presence of host material in the digestive tract. I also devised a lipid estimation model for eel muscle tissue, which can be used to lipid correct muscle samples, as well as demonstrate the viability

of eel caudal fins as a nonlethal surrogate tissue for isotope analysis.